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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/975,870 | 10/12/2001 | Ronald Arthur DuBose | ETACI | 9713 |
| 6980 | 7590 | 01/29/2004 | EXAMINER | |
| TROUTMAN SANDERS LLP BANK OF AMERICA PLAZA, SUITE 5200 600 PEACHTREE STREET, NE ATLANTA, GA 30308-2216 | | | SPITZER, ROBERT H | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1724 | |

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/975,870

Applicant(s)

DUBOSE ET AL.

Examiner

Robert H. Spitzer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicants' amendment of December 29, 2003 has resulted in the acceptance of the newly submitted Abstract of the Disclosure and the originally filed drawing sheets.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 4-16, 19, 20, 22-24, 27-37 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 is indefinite because it depends from canceled claim 3, and because there is no direct antecedent basis for the recitation of "said housing enclosure". Claims 8-10 and 12 are indefinite because there is no direct antecedent basis for the recitation of "said exchange medium". Claim 9 is indefinite because there is no direct antecedent basis for the recitation of "said magnesium aluminum silicate" in claim 9. Claim 13 is indefinite because it depends from canceled claim 3, and also because it recites "media element" without any correlation to "an exchange matrix" previously recited in claim 1. Claims 14-16 are indefinite because there is no direct antecedent basis for the recitation of "the enhancement technique". Claim 19 is indefinite because there is no direct antecedent basis for the recitations of "the media" and "the wheel". Claim 20 is indefinite because there is no direct antecedent basis for the recitation of "the media element and sealing system". Claim 22 is indefinite because there is no direct antecedent basis for the recitation of "said housing enclosure". Claim 23 is indefinite because there is no direct antecedent basis for the recitations of "the sealing system" and "the media". Claim 24 is indefinite because there

is no direct antecedent basis for the recitations of "the media element" and "the housing enclosure". Claim 27 is indefinite because it recites "media element" without any correlation to "an exchange matrix element" previously recited in claim 25. Claim 28 is indefinite because there is no direct antecedent basis for the recitations of "the sealing system" and "the media element". Claim 29 is indefinite because there is no direct antecedent basis for the recitation of "the sealing force". Claim 30 is indefinite because there is no direct antecedent basis for the recitation of "the media". Claim 31 is indefinite because there is no direct antecedent basis for the recitation of "said first and second plates", and because it recites that the species transfer is "from the second stream to the first stream", which is the opposite of the clear recitation in the last two lines of claim 25. Claim 32 is indefinite because there is no direct antecedent basis for the recitation of "said compression subassembly". Claims 34, 35 and 37 are indefinite because there is no direct antecedent basis for the recitation of "said exchange medium". Claim 40 is indefinite because as there is no ending "." (period), the Examiner does not know whether the claim is complete as written. Claims 5-7, 33 and 36 are indefinite because they depend from the above indefinite claims.

4. Claims 1, 2, 4, 5, 7-22, 25, 26 and 34-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over DuBose (6,013,385) in view of Siggelin (3,176,446). DuBose ('385) shows a device wherein exchange matrix 46 is housed within a housing assembly 44 (enthalpy transfer means) for treatment of the feed air to and the exhaust gas from a fuel cell. The claims differ from that structure of DuBose ('385) in the exchange matrix being made of a material having a linear coefficient of thermal expansion at 25 to 800°C

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of less than about $20 \times 10^{-7}/^{\circ}\text{C}$. Siggelin ('446) shows that a ceramic exchange matrix can have a linear coefficient of thermal expansion at 25 to 300°C of -2×10^{-7} , which is clearly below the value of 20. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to utilize a material for the enthalpy wheel of DuBose ('385) which has a linear coefficient of thermal expansion of less than $20 \times 10^{-7}/^{\circ}\text{C}$, in view of the showing of such material being used within an exchange matrix by Siggelin ('446).

5. Claims 6 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over DuBose (6,013,385) in view of Siggelin (3,176,446), as applied in the paragraph directly above, further in view of Goto (6,521,026). The claims differ from the structure of modified DuBose ('385) in the exchange matrix being structured as a plurality of fully segmented sections. Goto ('026) shows that such a plurality of fully segmented sections to an exchange matrix are known to the art. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to structure the exchange matrix of modified DuBose ('385) to consist of a plurality of fully segmented sections, in view of the showing of Goto ('026), as such structure would allow for easier replacement of any portion of the exchange matrix without having to change all of the sections.

6. Claims 23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over DuBose (6,013,385) in view of Siggelin (3,176,446), as applied in paragraph no. 4 above, further in view of Teller (3,183,649). The claims differ from the disclosure of modified DuBose ('385) in the use of a seal for the rotating enthalpy wheel. Teller ('649) shows the use of a seal for a rotating exchange matrix which has an inflatable seal

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(using a sealing fluid). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to provide an inflatable seal for the rotating enthalpy wheel of modified DuBose ('385), in view of the showing of Teller ('649), so that the wheel does not allow communication between the two streams which are passing therethrough.

7. Claims 24,28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over DuBose (6,013,385) in view of Siggelin (3,176,446), as applied in paragraph no. 4 above, further in view of Wenner (3,780,498). The claims differ from the structure of modified DuBose ('385) in the use of a frictional seal between the enthalpy wheel and its housing. Wenner ('498), in Fig. 4, shows the use of frictional seals between a rotating exchange matrix and its housing. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to provide a frictional seal for the rotating enthalpy wheel of modified DuBose ('385), in view of the showing of Wenner ('498), so that the wheel does not allow communication between the two streams which are passing therethrough.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over DuBose (6,013,385) in view of Siggelin (3,176,446), as applied in paragraph no. 4 above, further in view of Miller (2,617,986). The claim differs from the structure of modified DuBose ('385) in the use of spring loaded seals for the rotating enthalpy wheel. Miller ('986) shows that spring loaded seals (in Figs. 3,5 and 6) can be used to seal the ends of a rotating matrix from its housing and the streams passing therethrough. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to

provide a spring loaded seal for the rotating enthalpy wheel of modified DuBose ('385), in view of the showing of Miller ('986), so that the wheel does not allow communication between the two streams which are passing therethrough.

9. Applicants' amended page 5 of the specification, at line 2, "5" should be deleted and in line 7, "10" should be deleted. In the amended page 8 paragraph, line 1, "an" should be "can". There are also additional editorial changes which Applicants should make in their response to this Office action. They are as follows: page 2, line 3, the status of that application should be updated, if appropriate; page 11, line 7, "an" should be "a", and in line 14, "systems" should be "system"; page 13, line 9, "medim" should be either "media" or "medium"; page 14, line 2, "other" should be "another", in line 15, "selective" should be "selectively", in line 22, the first occurrence of "an" should be canceled, and in line 32, "chained" should be "chain"; and on page 20, line 22, "is" should be canceled.

10. Applicant's arguments filed December 29, 2003 have been fully considered but they are not persuasive. While Applicants are correct in their statement that the DuBose (6,013,385) is not a proper reference under 35 USC 102(b), it never-the-less is a proper reference under paragraph (e) of that same section, as the inventive entity is different from that of the instant application. Thus, the use of such reference is being maintained, with the addition of the Siggelin (3,176,446) reference thereto, because all of the claims now include the specific linear coefficient of thermal expansion value. The only argument made by Applicants is that as the DuBose ('6,013,385) reference is not a proper reference then "the USPTO has failed to establish a prima facie case of

obviousness". As pointed out in the above paragraphs, the Examiner does not agree and the rejections of the claims is maintained. It is also noted that Applicants did not respond to the section 112, second paragraph rejections of many of the claims. Those rejections have been repeated and expanded where appropriate. Any other remarks made by Applicants and not specifically commented upon by the Examiner, have been considered.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert H. Spitzer whose telephone number is (571) 272-1167. The examiner can normally be reached on Monday-Thursday from (5:30AM-4:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone

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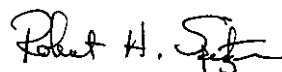
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number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-0987.

January 20, 2004



Robert H. Spitzer
Primary Examiner
Art Unit 1724

January 20, 2004